

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 586 (1976): Leclanche type dry batteries for telecommunications, signalling and general purposes [ETD 10: Primary Cells and Batteries]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

SPECIFICATION FOR LECLANCHE TYPE DRY BATTERIES FOR TELECOMMUNICATION, SIGNALLING AND GENERAL PURPOSES

(Third Revision)

First Reprint JUNE 1983

UDC 621.352.3:621.39



© Copyright 1976

INDIAN STANDARDS INSTITUTION

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR LECLANCHE' TYPE DRY BATTERIES FOR TELECOMMUNICATION, SIGNALLING AND GENERAL PURPOSES

(Third Revision)

Primary Cells and Batteries Sectional Committee, ETDC 10

Chairman

SHRI H. N. DOSHI

Members

DR S. S. MISHRA (Alternate to
Shri H. N. Doshi)

DR H. R. ALIMOHANDANI

SHRI B. K. AMDEKAR (Alternate)

ASSISTANT DIRECTOR
(ELECTRICAL ENGINEERING)
(SUBMARINE)

STAFF OFFICER (ELECTRICAL
ENGINEERING) (DESIGN)
(Alternate)

SHRI S. N. BANWET

SHRI MOHD MUMTAZ ALI KHAN (Alternate)

WG CDR H. S. BHATIA

SHRI H. C. PANDE (Alternate)

SHRI K. L. GARG

SHRI J. S. PASSI (Alternate)

GENERAL MANAGER (T) POSTS &
TELEGRAPHS, JABALPUR

DIVISIONAL ENGINEER,
TELEGRAPHS (A) (Alternate I)

DEPUTY GENERAL MANAGER
(X) (Alternate II)

SHRI M. HARADA

SHRI M. M. SHARMA (Alternate)

Representing

Estrela Batteries Ltd, Bombay

Havero Industries Ltd, Bombay

Naval Headquarters, Ministry of Defence, New
Delhi

Directorate General of Technical Development,
New Delhi

Directorate of Technical Development & Production
(Air), Ministry of Defence, New Delhi

Directorate General of Supplies & Disposals
(Inspection Wing), New Delhi

Directorate General of Posts & Telegraphs
(Department of Communication), New Delhi

Lakhanpal National Ltd, Baroda

(Continued on page 2)

© Copyright 1976

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
DR G. C. JAIN	National Physical Laboratory, New Delhi
SHRI S. K. KAPUR (<i>Alternate</i>)	
SHRI R. K. JAIN	Philips India Ltd, Calcutta
SHRI D. D. MAINI (<i>Alternate</i>)	
SHRI M. Z. KHAN	Geep Flashlight Industries Ltd, Allahabad
SHRI N. C. ROY (<i>Alternate</i>)	
SHRI J. S. MONGA	All India Radio & Electronics Association, Bombay
SHRI V. J. BHATT (<i>Alternate</i>)	
(Bombay)	
SHRI A. K. GHOSH (<i>Alternate</i>)	
(Calcutta)	
SHRI T. D. SADASIVAN (<i>Alternate</i>)	
(Madras)	
SHRI S. K. MUKHERJEE	National Test House, Calcutta
SHRI K. K. SHARMA (<i>Alternate</i>)	
DR U. NALLAPERUMAL	Union Carbide India Ltd, Calcutta
DR D. N. CHAKRAVARTY (<i>Alternate</i>)	
SHRI L. R. PARTHASARATHY, RDSO	Railway Board, Ministry of Railways
SHRI S. K. CHOPRA, RDSO (<i>Alternate</i>)	
SHRI M. G. POTDAR	Central Electrochemical Research Institute
	(CSIR), Karaikudi
SHRI A. K. A. WAHEED (<i>Alternate</i>)	
CDR R. RAJAGOPALAN	Directorate of Production (Naval) (Ministry of Defence), New Delhi
SHRI Y. B. RAO (<i>Alternate</i>)	
SHRI V. SARNEY	Toshiba Anand Batteries Ltd, Cochin
SHRI M. SUBRAMANIAN (<i>Alternate</i>)	
SHRI SARDUL SINGH	Controllerate of Inspection (Electronics)
	(Ministry of Defence), Bangalore
SHRI P. P. SINGH (<i>Alternate</i>)	
SHRI S. P. SACHDEV,	Director General, ISI (<i>Ex-officio Member</i>)
Director (Elec tech)	

Secretary

SHRI VIJAI

Deputy Director (Elec tech), ISI

Indian Standard

SPECIFICATION FOR LECLANCHE' TYPE DRY BATTERIES FOR TELECOMMUNICATION, SIGNALLING AND GENERAL PURPOSES

(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 27 April 1976, after the draft finalized by the Primary Cells and Batteries Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard was originally published in 1955. Its first revision was brought out in 1959 with a view to align it with the recommendations of IEC and to delete all references to internal constructional details. The second revision was published in 1964 in which some of the tests were further simplified. Subsequent to the publication of the second revision Amendments No. 1 and 2 were issued. The third revision, which incorporates these amendments, has been undertaken to make the standard up-to-date as per the latest manufacturing practices.

0.3 Inert cells and sack cells are still being used in India for telecommunication purposes, but there is increasing preference now for the dry batteries of the type covered in this standard, because of their simplicity of installation and convenience in handling coupled with economical services and it is believed that these advantages will essentially lead to their use in all such applications where the current drains are not so heavy as to make the use of wet cells necessary.

0.4 The atmospheric conditions specified in IS : 196-1966* have been kept as the basis for the tests and performance requirements laid down in this standard, in order that the cells conforming to this standard may be used in the climatic conditions normally prevailing in India. If, however, batteries are required for use in other climatic conditions, this shall be the subject of agreement between the supplier and the purchaser.

0.5 This standard shall be read in conjunction with IS : 6303-1971†.

*Atmospheric conditions for testing (revised).

†General requirements and tests for dry cells and batteries.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the dimensions, tests and performance requirements of Leclanche' type dry batteries of a nominal voltage of 1.5 V for telecommunication, signalling and general purposes.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 1885 (Part XV)-1967† and IS : 6303-1971‡ shall apply.

3. DESIGNATION

3.1 The batteries covered by this standard shall be designated as R40 in accordance with 3 of IS : 6303-1971‡.

4. DIMENSIONS AND MASS

4.1 The battery shall have the following dimensions and mass:

Diameter over jacket	67 mm, <i>Max</i>
Height over shoulder	157 mm, <i>Max</i>
Height over terminals	172 mm, <i>Max</i>
Mass	1.05 kg, <i>Max</i>

4.1.1 If an insulating cap is used at the bottom of the battery, the diameter shall not be measured over this cap.

5. MATERIALS AND CONSTRUCTION

5.1 General— The materials and construction shall be in accordance with 5 of IS : 6303-1971‡.

5.2 Jackets— The batteries shall be enclosed in close-fitting jackets of paperboard, plastic or other suitable insulating materials. Paperboard jackets may be treated with paraffin or other waterproofing material when required by the purchaser.

6. TERMINALS

6.1 Terminals for battery shall be of either spring-clip or screw type, as required by the purchaser.

*Rules for rounding off numerical values (*revised*).

†Electrotechnical vocabulary: Part XV Primary cells and batteries.

‡General requirements and tests for dry cells and batteries.

6.1.1 Screw terminals shall be in accordance with designation SC-1 or SC-2 of IS : 2652-1976*.

6.1.2 Spring clips shall be of the Fehnestock type and shall be in accordance with designation CL of IS : 2652-1976*.

6.1.3 The location of the terminals shall be such that, when screw terminals are provided, the spacing between centres of terminals shall be 27 ± 1.5 mm. In case of spring clips, the design and location of the negative terminal shall be such that no part of it extends outside the periphery of the jacket when the connecting wire is in place.

7. MARKING

7.1 Marking shall be in accordance with **8.1** and **8.3** of IS : 6303-1971† along with the designation as given in **3.1**.

8. TESTS

8.1 General — Provisions of **9.1** and **9.2** of IS : 6303-1971† shall apply.

8.1.1 Type Tests — The following shall constitute the type tests:

- a) Checking of dimensions and mass (4),
- b) Checking of terminals (6),
- c) Checking of marking (7),
- d) Materials and construction (5),
- e) Initial life tests (8.2),
- f) Delayed life test (8.3), and
- g) Delayed life test under dry heat conditions (8.4).

8.1.1.1 Samples for type tests shall be as shown in Table 1.

TABLE 1 MINIMUM NUMBER OF SAMPLES FOR TYPE TESTS

SL No.	TEST	NUMBER OF SAMPLES Min
(1)	(2)	(3)
i)	Checking of dimensions, mass, terminals and marking	3
ii)	Materials and construction	1
iii)	Initial life test:	
	a) Light intermittent discharge test	3
	b) 10-ohm continuous discharge test	3
	c) Heavy intermittent discharge test	3
iv)	Delayed life test (heavy intermittent discharge test)	3
v)	Delayed life test under dry heat conditions	3
	Total	19

*Schedule of terminals for Leclanche' type primary batteries (first revision).

†General requirements and tests for dry cells and batteries.

8.1.1.2 Criteria for approval — Provision of **9.3.1** of IS : 6303-1971* shall apply.

8.1.2 Acceptance Tests — The following shall constitute the acceptance tests:

- a) Checking of dimensions and mass (4),
- b) Checking of terminals (6),
- c) Checking of marking (7), and
- d) 10-ohm continuous discharge test (8.2.2).

8.1.2.1 The samples for acceptance tests and the criteria for acceptance shall be in accordance with Appendix A of IS : 6303-1971*.

8.2 Initial Life Tests — The batteries shall be tested in accordance with **9.5** of IS : 6303-1971* and subjected to the following discharge tests:

- a) Light intermittent discharge test (8.2.1),
- b) 10-ohm continuous discharge test (8.2.2), and
- c) Heavy intermittent discharge test (8.2.3).

8.2.1 Light Intermittent Discharge Test

8.2.1.1 Three batteries connected in series shall be discharged through a resistance of 20 ohms for 10 periods of 4 minutes each per day, beginning at hourly intervals during 7 days per week.

8.2.1.2 The following readings shall be taken:

- a) Initial closed-circuit voltage of the three batteries in series, and
- b) Closed-circuit voltage at the end of the tenth discharge of each succeeding fourteenth day.

8.2.1.3 The test shall be continued until the closed-circuit voltage of the three batteries in series falls below 2·80 V. The life shall be reported as the total number of days on test up to the first time the voltage reading falls below 2·80 V.

8.2.2 10-ohm Continuous Discharge Test

8.2.2.1 Three batteries connected in series shall be discharged continuously through a resistance of 10 ohms per cell in series. The test shall be continued until the end point voltage falls below 0·85 V per cell in series. The life shall be reported as the total number of days on test up to the first time the voltage reading falls below 0·85 V per cell in series.

*General requirements and tests for dry cells and batteries.

8.2.3 Heavy Intermittent Discharge Test

8.2.3.1 Three batteries in series shall be discharged through a resistance of 8 ohms ($2\frac{2}{3}$ ohms per cell) for two periods of one hour each per day according to the following schedule:

One hour discharge, 6 hours rest; one hour discharge, 16 hours rest.

8.2.3.2 The following readings shall be taken:

- Initial closed-circuit voltage of the three batteries in series, and
- Closed-circuit voltage at the end of the second discharge period of every alternate working day.

8.2.3.3 The test shall be continued until the closed-circuit voltage of the three batteries in series falls below 2.55 V. The life shall be reported as the total number of hours of actual discharge till the voltage reading falls below 2.55 V for the first time.

8.2.4 The initial life of batteries for the tests mentioned in 8.2.1 to 8.2.3 shall be not less than the appropriate rated life values specified in Table 2.

TABLE 2 INITIAL LIFE TESTS

DESIGNATION	RATED LIFE (Min)		
	Light Intermittent Discharge Test	10-ohm Continuous Discharge Test	Heavy Intermittent Discharge Test
(1)	(2)	(3)	(4)
	Days	Hours	Hours
R40	300	350	110

8.2.4.1 The batteries shall not show any leakage during or at the end of the tests.

8.3 Delayed Life Test

8.3.1 The test shall be carried out in accordance with 9.6 of IS : 6303-1971*. The batteries shall be stored for a period of 6 months and then tested in accordance with 8.2.3.

8.3.2 The life of the battery shall be not less than 100 hours.

8.4 Delayed Life Test Under Dry Heat Conditions

8.4.1 The test shall be carried out in accordance with 9.7 of IS : 6303-1971*. After storage, the batteries shall be tested in accordance with 8.2.3.

8.4.2 The life of the battery shall not be less than 83 hours.

*General requirements and tests for dry cells and batteries.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Conversion
Force	newton	N	1 N = 1 kg·m/s ²
Energy	joule	J	1 J = 1 N·m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V·s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31

Telegrams : Monaksanstha

Regional Offices:

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern : C. I. T. Campus, Adyar	MADRAS 600020	41 24 42

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Gangotri Complex, Bhadbhade Road, T.T. Nagar	BHOPAL 462003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
Ahimsa Bldg, SCO 82-83, Sector 17C	CHANDIGARH 160017	2 83 20
5-5-56C L. N. Gupta Marg	HYDERABAD 500001	22 10 83
D-277 Todarmal Marg, Banipark	JAIPUR 302006	6 68 32
117/418 B Sarvodaya Nagar	KANPUR 208005	8 12 72
Patilputra Industrial Estate	PATNA 800013	6 26 06
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27



AMENDMENT NO. 1 JANUARY 1984
TO

IS : 586-1976 SPECIFICATION FOR
LECLANCHE' TYPE DRY BATTERIES FOR
TELECOMMUNICATION, SIGNALLING
AND GENERAL PURPOSES

(*Third Revision*)

Alterations

[Page 5, Table 1, Sl No. (iii)(b), col 2] — Substitute '20-ohm' for '10-ohm'.

[Page 6, clause 8.1.2(d)] — Substitute the following for the existing 8.1.2(d):
'd) Continuous discharge test (8.2.2).'

[Page 6, clause 8.2, Item (b)] — Delete '10 ohm'.

(Page 6, clauses 8.2.2 and 8.2.2.1) — Substitute the following for the existing clauses:

'8.2.2 Continuous Discharge Test — The batteries shall be subjected to either of the tests given under 8.2.2.1 and 8.2.2.2, subject to agreement between the manufacturer and the user.

8.2.2.1 10-ohm continuous discharge test — Each cell shall be discharged continuously through a resistance of 10-ohms. The test shall be continued until the voltage falls below 0.85 V. The life shall be reported as the total number of hours on test up to the first time the voltage reading falls below 0.85 V.

The voltage readings shall be taken at 24 hourly intervals and exact life when the voltage falls below 0.85 V shall be calculated by interpolation.

8.2.2.2 20-ohm continuous discharge — Each cell shall be discharged continuously through a resistance of 20 ohms. The test shall be continued until the voltage falls below 1.00 V. The life shall be reported as the total number of hours on test up to the first time the voltage reading falls below 1.00 V.

The voltage readings shall be taken at 24 hourly intervals and exact life when the voltage falls below 1.00 V shall be calculated by interpolation.'

(Page 7, Table 2) — Substitute the following for the existing table:

TABLE 2 INITIAL LIFE TESTS

(Clause 8.2.4)

DESIGNATION	RATED LIFE (Min)			
	Light Inter- mittent Dis- charge Test	Continuous Discharge Test		Heavy Intermittent Discharge Test
		10-ohms	20-ohms	
(1)	(2)	(3)	(4)	(5)
	days	hours	hours	hours
R40	300	290	600	110

(ETDC 10)

AMENDMENT NO. 2 JANUARY 1991
TO
IS 586 : 1976 SPECIFICATION FOR LECLANCHE
TYPE DRY BATTERIES FOR TELECOMMUNICATION,
SIGNALLING AND GENERAL PURPOSES

(Third Revision)

(Page 3, clause 0.5) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 2.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 3.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 5.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 5, clause 7.1) — Substitute the following for the existing clause:

"6.1 Marking shall be done in accordance with IS 6303 : 1984 'General requirements and methods of tests for dry cells and batteries (first revision)', read with Amendment No. 1 and Amendment No. 2".

(Page 5, clause 8.1) — Substitute the following for the existing clause:

"8.1 Provisions of 7.1 to 7.3 of IS 6303 : 1984 shall apply."

(Page 6, clause 8.1.1.2) — Substitute the following for the existing clause:

"8.1.1.2 Provisions of 7.4.1 of IS 6303 : 1984 shall apply."

(Page 6, clause 8.1.2.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 6, clause 8.2) — Substitute '7.5 of IS 6303 : 1984' for '9.5 of IS 6303 : 1971'.

(Page 7, clause 8.3.1) — Substitute the following for the existing clause:

"8.3.1 The test shall be carried out in accordance with 7.7 of IS 6303 : 1984."

"8.3.1.1 The batteries shall be stored for a period of 6 months and then tested in accordance with 8.2.3. The life of the battery shall not be less than 100 hours."

(Page 7, clause 8.3.2) — Substitute the following for the existing clause:

"8.3.2 The batteries shall also be stored for expiry period which may be 12 months or more and then tested in accordance with 8.2.3. The rated life of the battery shall be not less than 70 percent of its initial life."

(Page 7, clause 8.4.1) — Substitute '7.8 of IS 6303 : 1984' for '9.7 of IS 6303 : 1971'.

AMENDMENT NO. 3 AUGUST 1991
TO
IS 586 : 1976 SPECIFICATION FOR LECLANCHE TYPE
DRY BATTERIES FOR TELECOMMUNICATION,
SIGNALLING AND GENERAL PURPOSES
(Third Revision)

[Delete Amendment No. 2 January 1991.]

(Page 3, clause 0.5) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 2.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 3.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 4, clause 5.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 5, clause 7.1) — Substitute the following for the existing clause:

"7.1 Marking shall be done in accordance with IS 6303 : 1984 'General requirements and methods of tests for dry cells and batteries (first revision)', read with Amendment No. 3."

(Page 5, clause 8.1) — Substitute the following for the existing clause:

'8.1 Provisions of 7.1 to 7.3 of IS 6303 : 1984 shall apply.'

(Page 6, clause 8.1.1.2) — Substitute the following for the existing clause:

'8.1.1.2 Provisions of 7.4.1 of IS 6303 : 1984 shall apply.'

(Page 6, clause 8.1.2.1) — Substitute 'IS 6303 : 1984' for 'IS 6303 : 1971'.

(Page 6, clause 8.2) — Substitute '7.5 of IS 6303 : 1984' for '9.5 of IS 6303 : 1971'.

(Page 7, clause 8.3.1) — Substitute the following for the existing clause:

'8.3.1 The test shall be carried out in accordance with 7.7 of IS 6303: 1984.'

'8.3.1.1 The batteries shall be stored for a period of 6 months and then tested in accordance with 8.2.3. The life of the battery shall not be less than 100 hours.'

(Page 7, clause 8.3.2) — Substitute the following for the existing clause:

'8.3.2 The batteries shall also be stored for expiry period which may be 12 months more and then tested in accordance with 8.2.3. The rated life of the battery shall be not less than 70 percent of its rated initial life.'

(Page 7, clause 8.4.1) — Substitute '7.8 of IS 6303 : 1984' for '9.7 of IS 6303 : 1971'.

(ETD 10)